

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : LANDING/DECELERATION-LGC FMEA NO 02-1A- 006-1

REV: 09/19/88

ASSEMBLY : MAIN LANDING GEAR (MLG)

P/N RI : MC621-0011

P/N VENDOR: 1170149 MENASCO

QUANTITY : 2

: LEFT HAND

: RIGHT HAND

VEHICLE	102	CRIT. FUNC:	1
EFFECTIVITY:	X	CRIT. HDW:	1
PHASE(S):	PL LO	103	104
		X	X
		OO	DO X LS

PREPARED BY:

DES R. A. GORDON

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REDUNDANCY SCREEN:

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ITEM:

MAIN LANDING GEAR UPLOCK ROLLER RETAINER ASSEMBLY

FUNCTION:

RETAINS ROLLER WHICH IS THE MAIN HOLDING PIN FOR MLG STRUT IN THE RETRACTED POSITION. THE UPLOCK HOLDS THE ROLLER WHEN THE MLG IS RETRACTED.

FAILURE MODE:

STRUCTURAL FAILURE

CAUSE(S):

OVERLOAD, DEFECTIVE PART/MATERIAL.

EFFECT(S) ON:

(A) SUBSYSTEM (B) INTERFACES (C) MISSION (D) CREW/VEHICLE

(A) FUNCTIONAL DEGRADATION, PRE-RELEASE OF M/G ASSY. DOOR MAY BUCKLE UNDER GEAR WEIGHT AND CRACK OPEN.

(B) PROBABLE LOSS OF DOOR ASSEMBLY INTEGRITY TO SEAL COMPARTMENT FROM HIGH-TEMPERATURE FLOWS.

(C, D) POSSIBLE LOSS MISSION/CREW/VEHICLE DUE TO RE-ENTRY OVERHEATING.

DISPOSITION & RATIONALE:

(A) DESIGN (B) TEST (C) INSPECTION (D) FAILURE HISTORY (E) OPERATIONAL USE

(A) DESIGN

DESIGNED TO A FATIGUE LOAD SPECTRUM FOR RETRACTION, EXTENSION, OPERATIONAL AND STOWAGE CONDITIONS. DESIGNED TO A MINIMUM FACTOR OF SAFETY OF 1.4 WITH STANDARD MATERIAL ALLOWABLES. MATERIALS USED ARE NOT SUSCEPTIBLE TO CORROSION DUE TO EXPOSURE TO EXPECTED ORBITER ENVIRONMENTS.

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(B) TEST

QUALIFICATION TESTS: CERTIFICATION INCLUDES A FATIGUE LOAD TEST SPECTRUM REPRESENTING THE EQUIVALENT LOADING FOR THE LIFE OF EACH LANDING GEAR. SCATTER FACTOR OF 4.0 WAS APPLIED SUCH THAT THE SPECTRUM WAS REPEATED FOR A TOTAL OF FOUR TIMES (400 DEPLOYMENT CYCLES).

THE UPLOCK ROLLER RETAINER ASSEMBLY WAS CERTIFIED AS AN INTEGRAL PART OF THE MLG MECHANISM INSTALLATION (LANDING GEAR OPERATION) - 32 CYCLES OF THE LANDING GEAR DURING ALT, 15 DEVELOPMENT CYCLES AND 353 QUALIFICATION LIFE CYCLES FOR A TOTAL OF 400 CYCLES. (THE LANDING GEAR WAS CYCLED FROM UP AND LOCKED TO DOWN AND LOCKED EACH TIME).

ENVIRONMENT:

HIGH TEMP TESTS: 3 CYCLES AT 140 DEG F

COLD TEMP TESTS: 3 CYCLES AT -35 DEG F TO -40 DEG F

ACCEPTANCE TESTS: ACCEPTANCE INCLUDES VERIFICATION THAT CERTIFIED MATERIALS AND PROCESSES WERE USED. ACCEPTANCE TESTS ALSO VERIFY DIMENSIONS, WEIGHTS AND FINISHES.

OMRSD: MLG ZONAL DETAIL VISUAL INSPECTION; THE UPLOCK ROLLER ASSEMBLY IS INSPECTED FOR CONDITION AND SECURITY.

FREQUENCY - ALL VEHICLES AT GROUND TURNAROUND.

(C) INSPECTION

RECEIVING INSPECTION

INSPECTION VERIFIES ALL RAW MATERIALS TO COMPLY WITH MATERIAL REQUIREMENTS THROUGH PERIODIC COUPON ANALYSIS.

CONTAMINATION CONTROL

CLEANLINESS REQUIREMENTS VERIFIED BY INSPECTION.

ASSEMBLY/INSTALLATION

ALL MATERIAL PROCESSES VERIFIED BY MANDATORY INSPECTION POINTS (MIP'S) PRIOR TO NEXT MANUFACTURING OPERATIONS.

CRITICAL PROCESSES

HEAT TREATMENT AND SHOT PEENING ARE VERIFIED BY INSPECTION.

NONDESTRUCTIVE EVALUATION

MATERIAL SURFACE DEFECTS ARE VERIFIED BY MAGNETIC PARTICLE, NITAL ETCH AND FLUORESCENT PENETRANT INSPECTION.

TESTING

ATP IS VERIFIED BY INSPECTION.

PACKAGING/HANDLING

HANDLING AND PACKAGING REQUIREMENTS ARE VERIFIED BY INSPECTION.

(D) FAILURE HISTORY

NONE.

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(E) OPERATIONAL USE  
NONE.

02-1A-18